Using the Shure® MX392 Push to Talk Microphone with Vortex® Devices

Application Note

Polycom Installed Voice Business Group

September 2004
Rev. B

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SHURE® MX392 BASICS

The Shure MX392 is a surface-mount, electret microphone that includes a programmable membrane on/off switch that can be controlled externally via logic input / output terminals. This application note explores how to connect the MX392 to a Vortex device (EF2280, EF2241, EF2201, EF2210, or EF2211) as well as how to program the Vortex device and MX392 to achieve the desired control over the membrane switch.

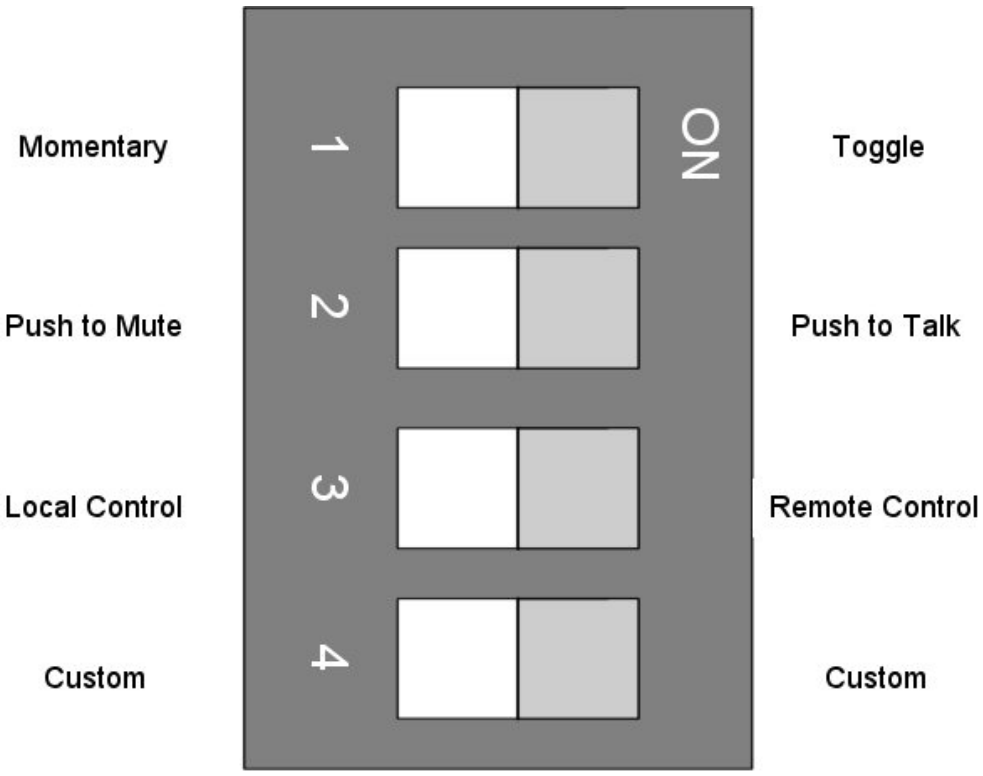
The MX392 includes three extra conductors as part of the microphone cable:

- LOGIC GND (Green): Connects to the logic ground of the Vortex Device. This can be either Pin 25 of the Logic Input port or Pins 21-25 of the Logic Output port.
- SWITCH OUT (White): Provides a TTL logic low when the membrane switch is pressed. This signal is available at all times for all switch settings. The SWITCH OUT function provides a momentary closure when S1 is OFF and a latching closure when S1 is ON. This conductor will go to one of the Logic Input Pins of the Vortex Device (Pins 1-24).
- LED IN (Orange): This terminal draws 5 V DC. This function can be modified so that the Vortex Device controls the action of the LED by flipping S3 to the ON position. If this terminal is shorted to LOGIC GND, the LED turns on.

The MX392 includes a set of 4 DIP switches that are located on the printed circuit board of the microphone. These DIP switches change the functionality of the membrane switch. For reference, here is a list of all possible functions of the switch:

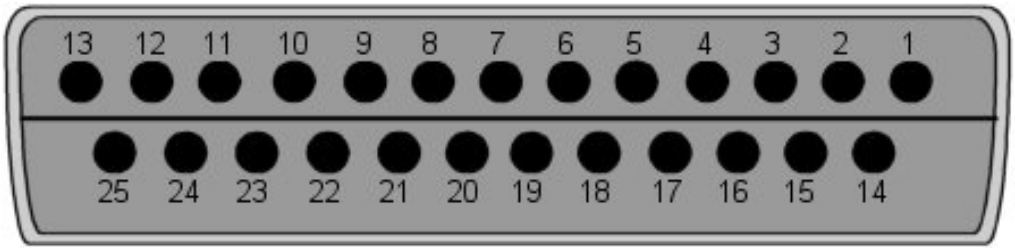
Switch Behavior	User Action Required / LED Behavior	DIP Switch Settings
Push to Mute, Release to Talk (As Shipped)	Press and hold switch to temporarily mute microphone; release switch to unmute. LED on when microphone is active.	S1 = OFF S2 = OFF S3 = OFF S4 = OFF
Push to Talk, Release to Mute	Press and hold switch to activate microphone; release switch to mute. LED on when microphone is active.	S1 = OFF S2 = ON S3 = OFF S4 = ON
Toggle: Push On/Push Off	Press switch to toggle microphone on and off. LED on when microphone is active.	S1 = ON S2 = ON for muted initial state S2 = OFF for active initial state S3 = OFF S4 = OFF
Microphone Always Active (switch available for logic functions only)	LED always off. If LED IN is shorted to LOGIC GROUND terminal, LED always on.	S1 = OFF S2 = OFF S3 = ON S4 = OFF
Automatic Mixer Mode (MX392 Models only)	If S1 = OFF, SWITCH OUT will be momentarily logic low when switch is pressed. If S1 = ON, SWITCH OUT will be latching low when switch is pressed. Connect SWITCH OUT signal to Logic Input port (Pins 1-24). Connect LED IN to Logic Output port to have EF Device control the action of the LED.	S1 = ON or OFF S2 = OFF S3 = ON S4 = OFF

Here is a drawing showing the functionality that is assigned to each DIP Switch:

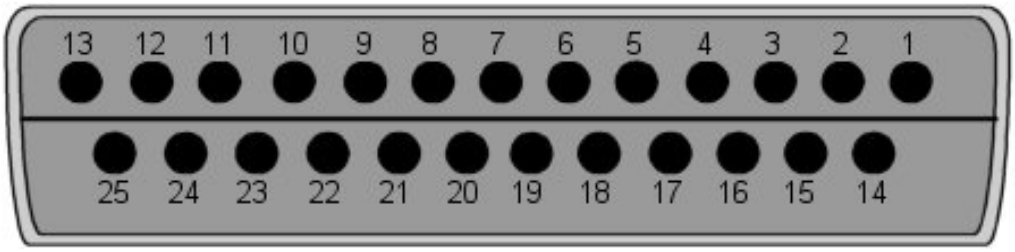


Logic Port

The Logic Input port is a female DB-25 connector where pins 1-24 can be programmed to execute commands via the Logic Input page. Pin 25 is the ground pin and it can sink up to 500 mA of current.



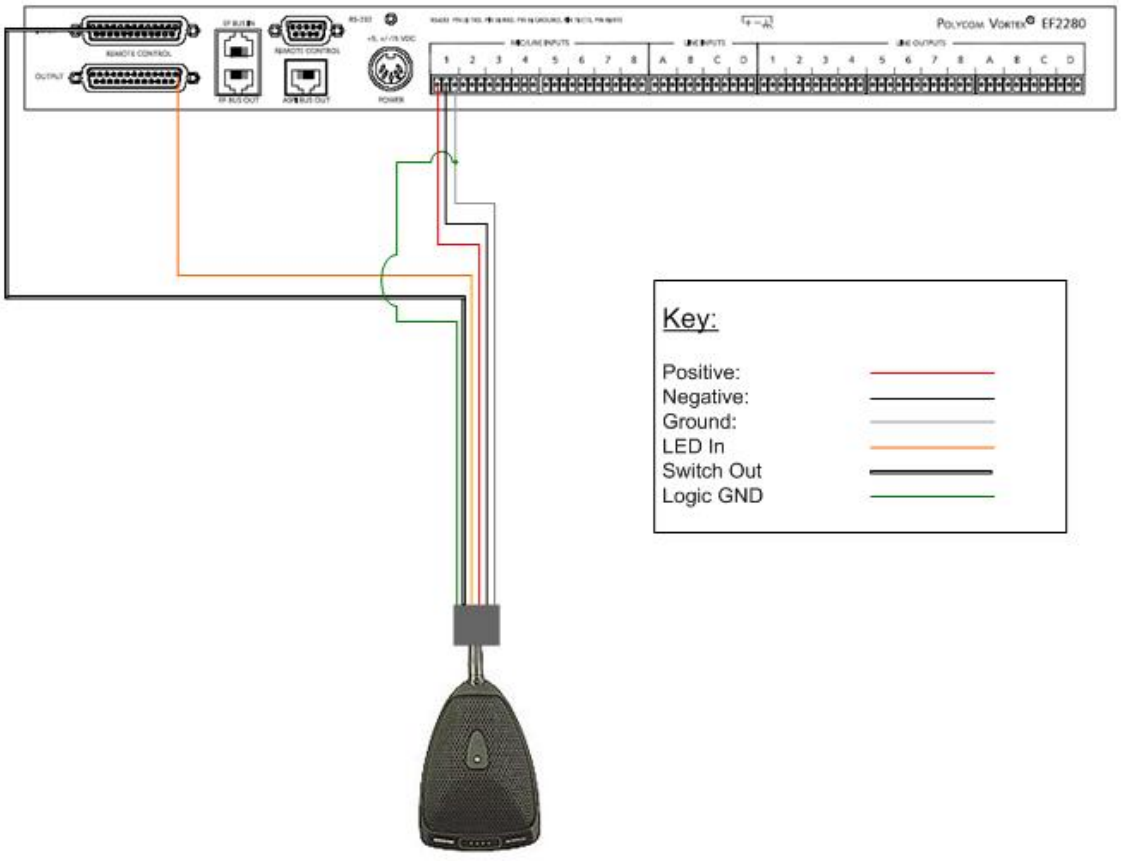
The Logic Output port is a female DB-25 connector where pins 1-20 can be programmed. Pins 21-25 are ground pins. Each pin can source up to 20 mA of current and each ground pin can sink up to 100 mA of current.



Physical Connections and Grounding

In order to connect the microphone to the Vortex Device, first connect the audio portion of the microphone to the Vortex Device: Connect the Positive conductor (Red) to the Positive terminal, the Negative conductor (Black) to the Negative terminal, and the Ground wire (gray) to the Ground terminal. Next, connect the SWITCH OUT (white) conductor to one of the Logic Input pins 1-24 and then connect the LED IN (orange) conductor to one of the Logic Output pins 1-20 (Note that the Logic Input and Outputs pins are fully programmable). Next, connect the LOGIC GND wire (green) to the audio ground wire. Although, you can connect the LOGIC GND wire to one of the ground pins on either the Logic Input or Logic Output port, both the Logic port ground pins and the audio ground pin are tied to chassis ground of the unit.

The drawing below shows how to perform the wiring. Note that for clarification purposes the LOGIC GND wire is shown tied to the audio signal ground near the unit; however, this connection may be made at the microphone itself so that you will only need a 4 conductor cable plus ground wire to connect the microphone to the Vortex Device.



TOGGLE OPERATION (PUSH TO TALK)

Let's say that you want MX392 to be muted by default. If someone pushes the membrane switch, you want the microphone to stay unmuted until the user presses the switch to mute the microphone. You also want the LED to illuminate when the microphone is unmuted.

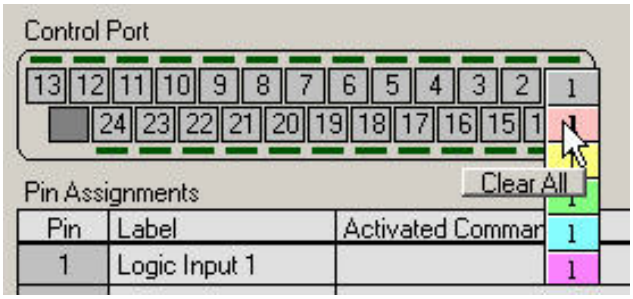
First, set DIP Switch S1, S2, and S3 to ON and set S4 to OFF. Then, connect SWTICH OUT to one of the Logic Input pins 1-24. Connect LOGIC GND to Logic Output pins 21-25. Connect LED IN to one of the Logic Output pins 1-20.

DEFAULT CONDITIONS

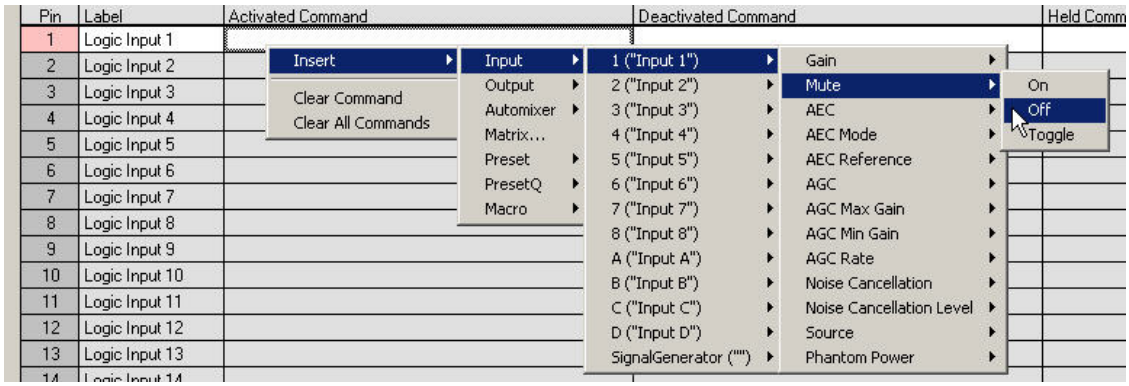
First, you want to make sure that the Vortex Device has all microphones muted as part of the Power on Preset. Next, you need to make sure that if the unit is controlled by a control system that the proper commands are sent to the Vortex Device to mute the microphones when the room is used for conferencing or sound reinforcement purposes. Remember that since the requirement is push to talk, the user of the microphone is the one that must initiate the activity of unmuting the microphone.

LOGIC INPUT

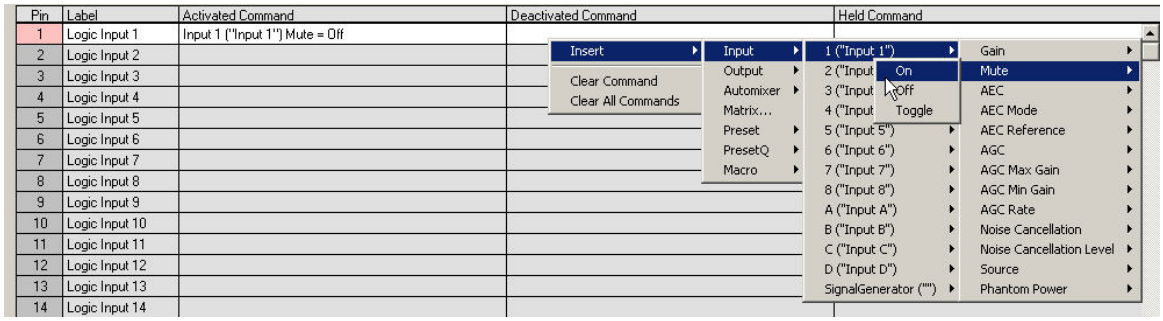
Go to the Logic Input page of Conference Composer™. If the SWITCH OUT wire is connected to Logic Input pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic and selecting the pink color (The pink color means that the pin is not grouped to other pins).



Now, right click in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the switch goes Active Low (0V DC), the Vortex Device will unmute Input 1.

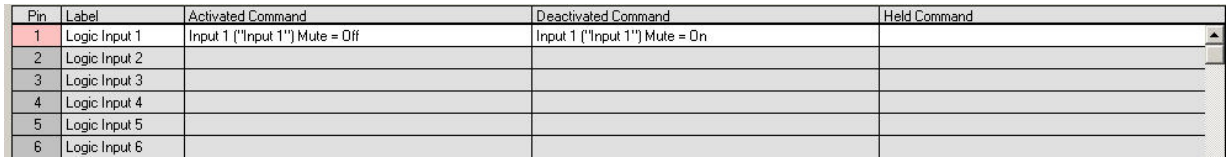


Now, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, ON. Now, whenever the switch goes Active High (+ 5V DC), the Vortex Device will mute Input 1.

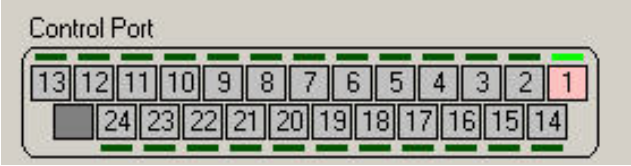


Do not assign any command to the HELD COMMAND column.

If you are successful, you should see this on the screen:



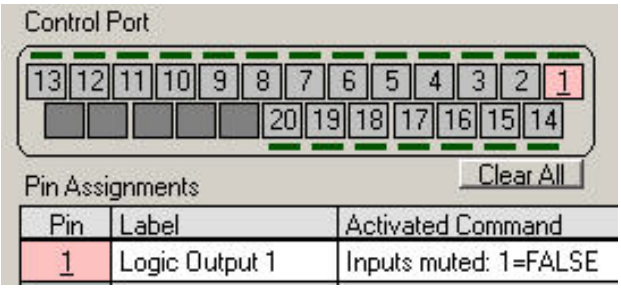
Make sure that the physical wiring works by pressing the membrane switch. You should see the LED above the pin assignment lit in green:



Repeat the above process for each MX392 microphone that you want to connect to the Vortex Device.

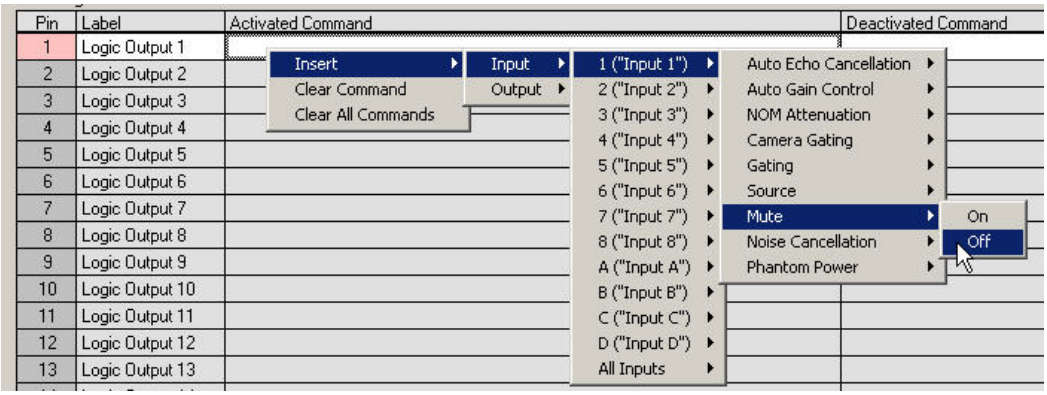
Logic Output

Go to the Logic Output page of Conference Composer. If the LED IN wire is connected to Logic Output pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic. The pin will turn color from gray to pink. Next, right-click on the pin and reverse the polarity. A horizontal bar should appear under the pin number in the DB-25 graphic and under the pin number under the Pin column:

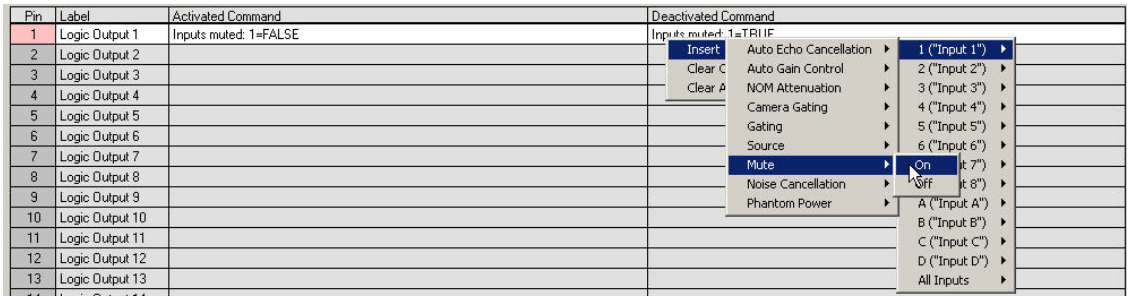


Reversing the polarity is critical to proper operation. When S3 is in the ON position, the MX392 wants to see an Active Low signal (0V DC) from the Vortex Device in order to illuminate the LED. By default, the EF Device has been designed to assume that an Active High signal (+5V DC) is required to drive an LED. The MX392 uses the active low signal to use part of the phantom power voltage to illuminate the LED. If you do not reverse the polarity, the LED will light up exactly the opposite way you will have intended.

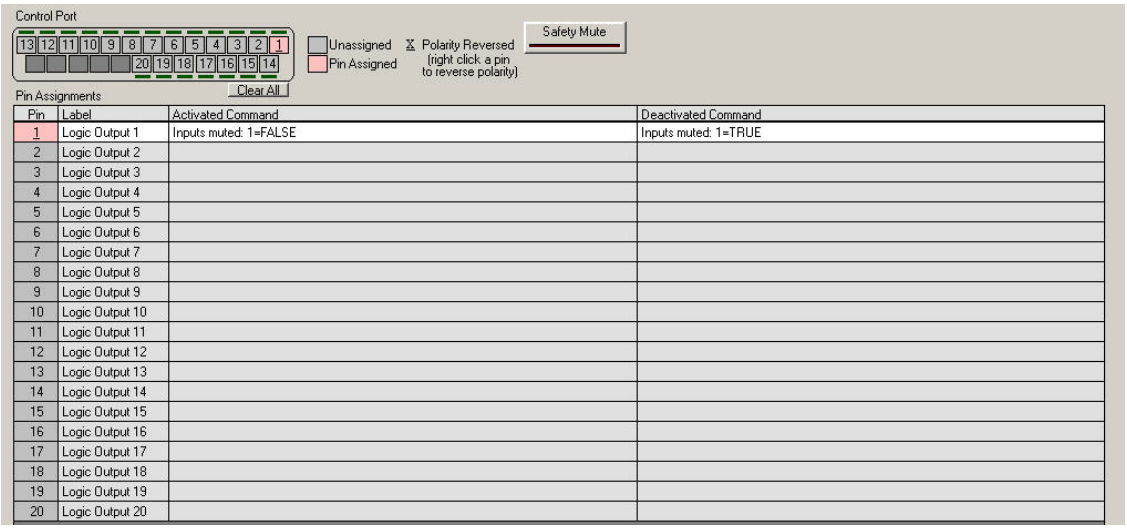
Next, right click in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the microphone is unmuted (Mute = False), the LED will illuminate on the MX392.



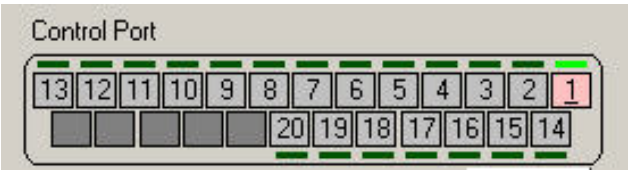
Next, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, ON. Now, whenever the microphone is muted (Mute = True), the LED will not illuminate on the MX392.



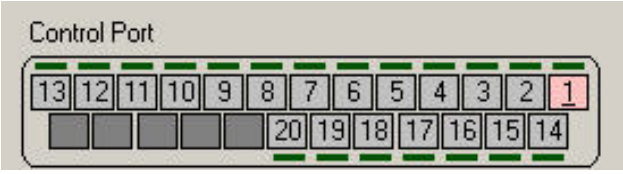
Here is what the screen should look like when you are finished:



Make sure the LED works as designed. If you press the membrane switch, you should see the LED above the pin illuminate in Conference Composer as well as on the MX392. Since the switch is a toggle switch, the LED will stay lit until the switch is pushed again:



When the membrane switch is pushed again, the Vortex Device toggles the state from unmuted to muted. Now, the LED should not be illuminated since the input from the MX392 is now muted. Both LED's (Conference Composer and MX392) should not be illuminated:



TOGGLE OPERATION (PUSH TO MUTE)

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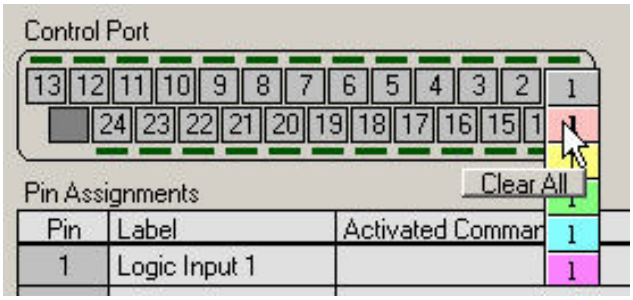

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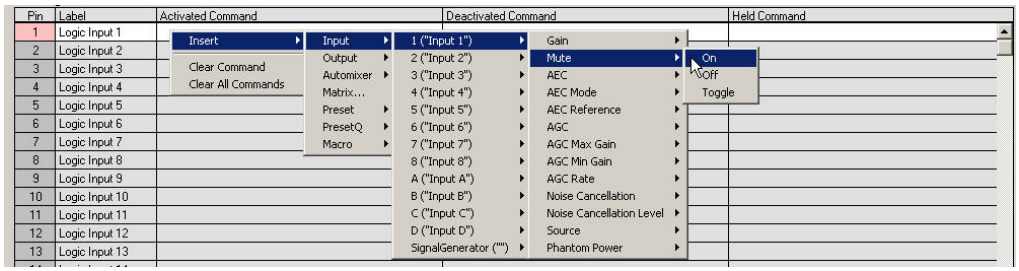
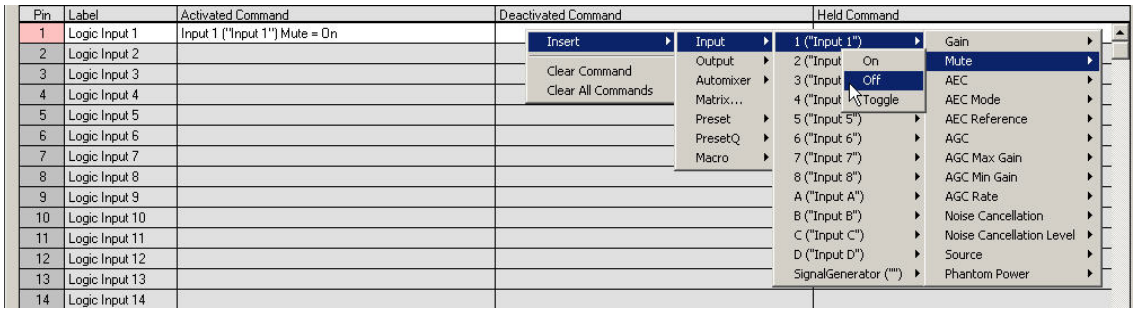


Now, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the switch goes Active High (+ 5V DC), the Vortex Device will unmute Input 1.



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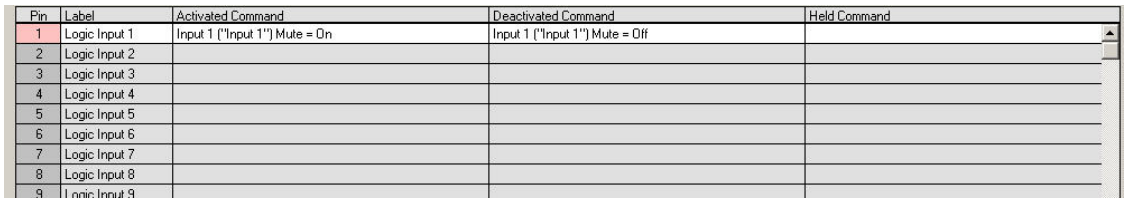

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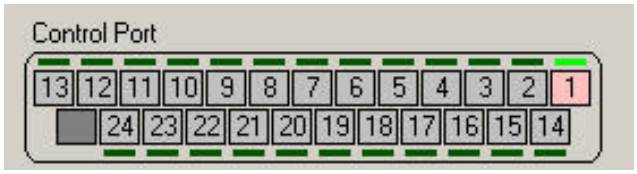
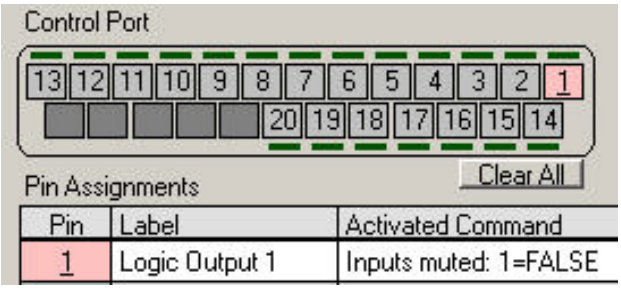


Repeat the above process for each MX392 microphone that you want to connect to the Vortex Device.

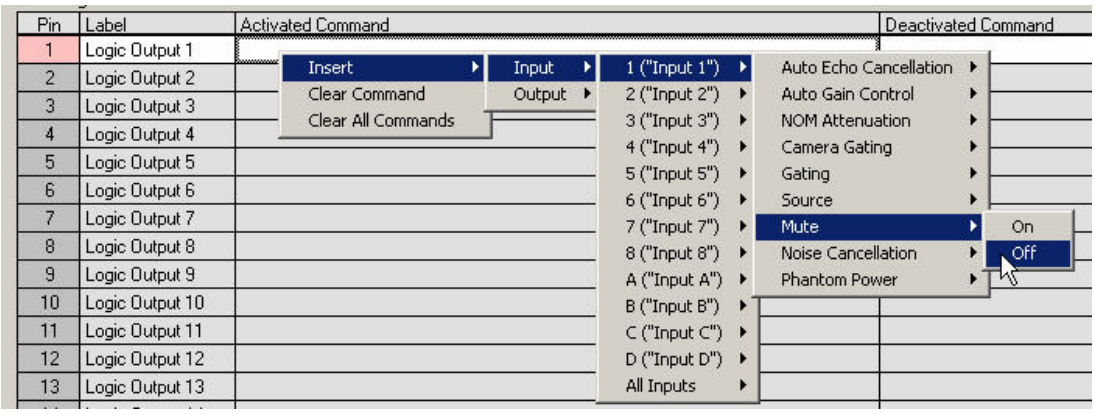
Logic Output

Go to the Logic Output page of Conference Composer. If the LED IN wire is connected to Logic Output pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic. The pin will turn color from gray to pink. Next, right-click on the pin and reverse the polarity. A horizontal bar should appear under the pin number in the DB-25 graphic and under the pin number under the Pin column:



Reversing the polarity is critical to proper operation. When S3 is in the ON position, the MX392 wants to see an Active Low signal (0V DC) from the Vortex Device in order to illuminate the LED. By default, the EF Device has been designed to assume that an Active High signal (+5V DC) is required to drive an LED. The MX392 uses the active low signal to use part of the phantom power voltage to illuminate the LED. If you do not reverse the polarity, the LED will light up exactly the opposite way you will have intended.

Next, right click in the Activated Command column for Logic Input 1 and select Insert, Input, 1, Mute, Off. Now, whenever the microphone is unmuted (Mute = False), the LED will illuminate on the MX392.



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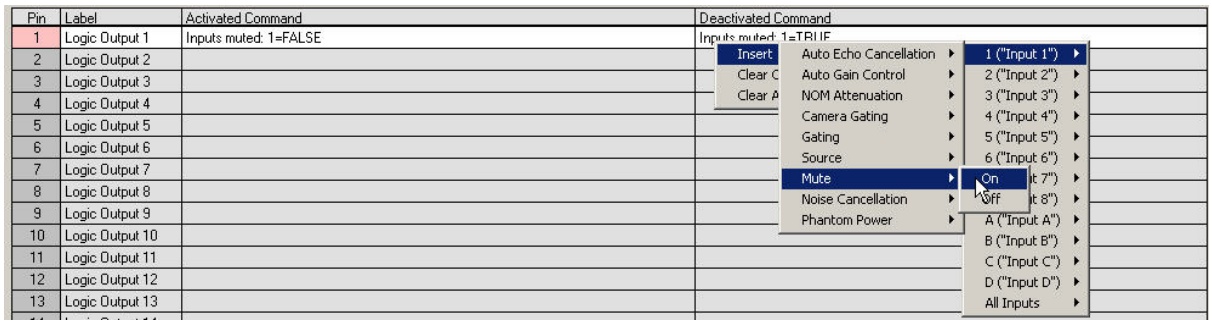
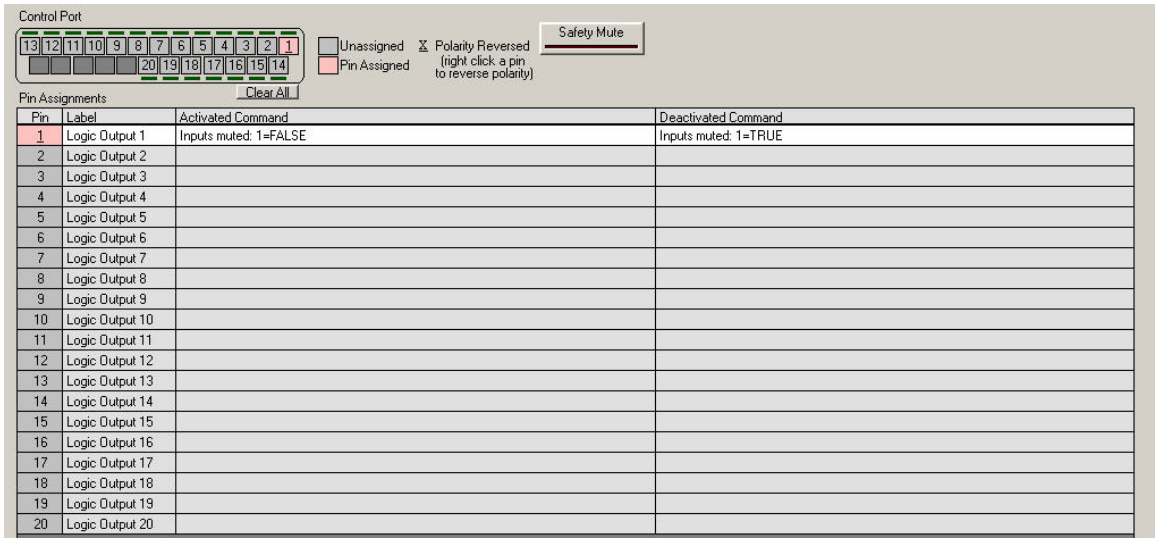
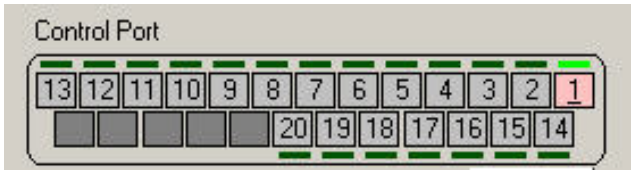


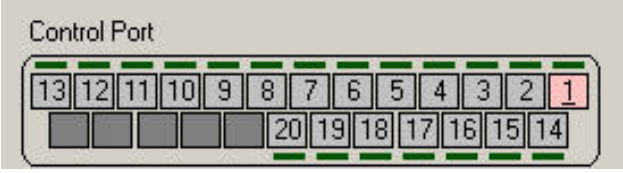
Here is what the screen should look like when you are finished:



Make sure the LED works as designed. If you press the membrane switch, you should see the LED above the pin illuminate in Conference Composer as well as on the MX392. Since the switch is a toggle switch, the LED will stay lit until the switch is pushed again:



When the membrane switch is pushed again, the EF Device toggles the state from unmuted to muted. Now, the LED should not be illuminated since the input from the MX392 is now muted. Both LED's (Conference Composer and MX392) should not be illuminated:



TOGGLE OPERATION MUTE ALL EXAMPLE

Let's say that you have 2 Vortex units linked together via EFBus--1 EF2280 at Device ID 00 and 1 EF2241 at Device ID 01. When someone pushes the membrane switch on one microphone, you want that action to mute all microphones as well as turn off the LED. This example explores the process in achieving that goal.

First, set DIP Switch S1, S2, and S3 to ON and set S4 to OFF. Then, connect SWTICH OUT to one of the Logic Input pins 1-24. Connect LOGIC GND to Logic Output pins 21-25. Connect LED IN to one of the Logic Output pins 1-20.

DEFAULT CONDITIONS

First, you want to make sure that the Vortex Device has all microphones unmuted as part of the Power on Preset. Next, you need to make sure that if the unit is controlled by a control system that the proper commands are sent to the Vortex Device to unmute the microphones when the room is used for conferencing or sound reinforcement purposes. Remember that since the requirement is push to mute, the user of the microphone is the one that must initiate the activity of muting the microphone.

MACROS

Go to the MACROS page of Conference Composer. To make things easy, label Macro 0 as MUTE ON and label Macro 1 as MUTE OFF. Then, for each microphone that is physically connected to the Vortex, add commands to Macro 0 that mute the microphones and add commands to Macro 1 that unmute the microphones. When you're done, this is what the Macros page should look like:

Macro	Name	Item	Command
0	MUTE ON	1	Input 1 ("Mic 1") Mute = On
		2	Input 2 ("Mic 2") Mute = On
		3	Input 3 ("Mic 3") Mute = On
		4	Input 4 ("Mic 4") Mute = On
		5	Input 5 ("Mic 5") Mute = On
		6	Input 6 ("Mic 6") Mute = On
		7	Input 7 ("Mic 7") Mute = On
		8	Input 8 ("Mic 8") Mute = On
1	MUTE OFF	1	Input 1 ("Mic 1") Mute = Off
		2	Input 2 ("Mic 2") Mute = Off
		3	Input 3 ("Mic 3") Mute = Off
		4	Input 4 ("Mic 4") Mute = Off
		5	Input 5 ("Mic 5") Mute = Off
		6	Input 6 ("Mic 6") Mute = Off
		7	Input 7 ("Mic 7") Mute = Off
		8	Input 8 ("Mic 8") Mute = Off
2	Macro 2		

Likewise, here is the Macros page for the Vortex EF2241:

Macro	Name	Item	Command
0	MUTE ON	1	Input 1 ("Mic 9") Mute = On
		2	Input 2 ("Mic 10") Mute = On
		3	Input 3 ("Mic 11") Mute = On
		4	Input 4 ("Mic 12") Mute = On
1	MUTE OFF	1	Input 1 ("Mic 9") Mute = Off
		2	Input 2 ("Mic 10") Mute = Off
		3	Input 3 ("Mic 11") Mute = Off
		4	Input 4 ("Mic 12") Mute = Off

In order for one microphone to mute all microphones, we need to be able to mute and unmute the microphones on all units regardless of whether a microphone is muted from the Vortex EF2280 or the EF2241. To accomplish this, we will use the **BROADA** command to send MUTEI commands from one unit to the other unit. The **BROADA** command broadcasts any command that is after the colon. For example, if a Macro in the Vortex EF2241 has this command:

BROADA:F00MUTEI11

then when this Macro is executed, the microphone that is connected to EF2280 ID 00 will be muted.

In order to do this, let's look at the Macros page of the Vortex EF2280. Left-click on Item 8 in Macro 0. Then click the INSERT button to add a ninth command to Macro 0. At this point, place the cursor in the COMMAND column and type:

BROADA:B01MUTEI11

Repeat that same process for Inputs 2-4 of the Vortex EF2241. The, perform the same procedure to unmute Inputs 1-4 on the Vortex EF2241. Remember that there is a colon after the **BROADA** command. When you are finished, here is what the Macros page should look like:

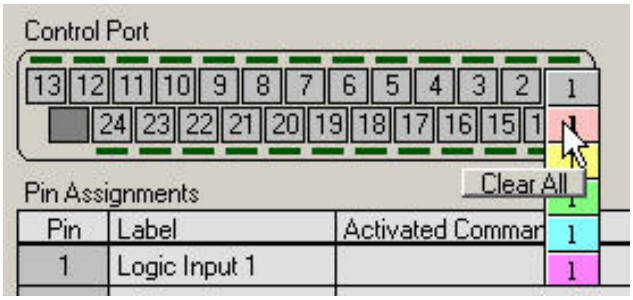
Macro	Name	Item	Command
0	MUTE ON	1	Input 1 ("Mic 9") Mute = On
		2	Input 2 ("Mic 10") Mute = On
		3	Input 3 ("Mic 11") Mute = On
		4	Input 4 ("Mic 12") Mute = On
		5	BROADA:F00MUTE11
		6	BROADA:F00MUTEI21
		7	BROADA:F00MUTEI31
		8	BROADA:F00MUTEI41
		9	BROADA:F00MUTEI51
		10	BROADA:F00MUTEI61
		11	BROADA:F00MUTEI71
		12	BROADA:F00MUTEI81
1	MUTE OFF	1	Input 1 ("Mic 9") Mute = Off
		2	Input 2 ("Mic 10") Mute = Off
		3	Input 3 ("Mic 11") Mute = Off
		4	Input 4 ("Mic 12") Mute = Off
		5	BROADA:F00MUTEI10
		6	BROADA:F00MUTEI20
		7	BROADA:F00MUTEI30
		8	BROADA:F00MUTEI40
		9	BROADA:F00MUTEI50
		10	BROADA:F00MUTEI60
		11	BROADA:F00MUTEI70
		12	BROADA:F00MUTEI80

Follow the same procedure for muting the Inputs 1-8 on the Vortex EF2280 from the EF2241. Here is what the Macros page for the Vortex EF2241 should look like when you are finished:

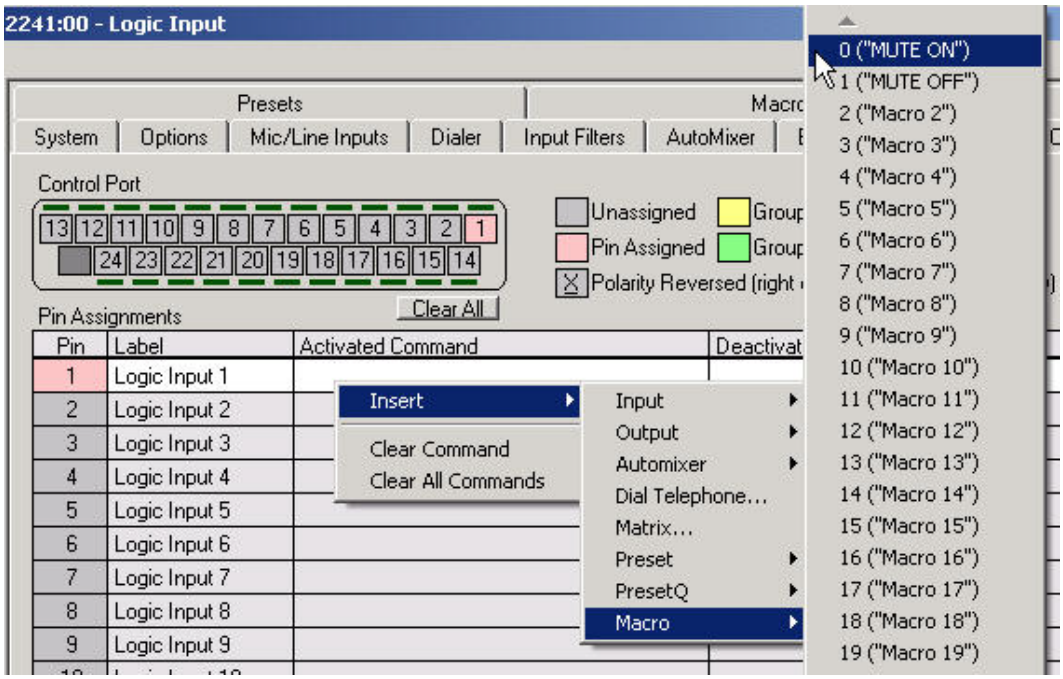
Macro	Name	Item	Command
0	MUTE ON	1	Input 1 ("Mic 1") Mute = On
		2	Input 2 ("Mic 2") Mute = On
		3	Input 3 ("Mic 3") Mute = On
		4	Input 4 ("Mic 4") Mute = On
		5	Input 5 ("Mic 5") Mute = On
		6	Input 6 ("Mic 6") Mute = On
		7	Input 7 ("Mic 7") Mute = On
		8	Input 8 ("Mic 8") Mute = On
		9	BROADA:B01MUTEI11
		10	BROADA:B01MUTEI21
		11	BROADA:B01MUTEI31
		12	BROADA:B01MUTEI41
1	MUTE OFF	1	Input 1 ("Mic 1") Mute = Off
		2	Input 2 ("Mic 2") Mute = Off
		3	Input 3 ("Mic 3") Mute = Off
		4	Input 4 ("Mic 4") Mute = Off
		5	Input 5 ("Mic 5") Mute = Off
		6	Input 6 ("Mic 6") Mute = Off
		7	Input 7 ("Mic 7") Mute = Off
		8	Input 8 ("Mic 8") Mute = Off
		9	BROADA:B01MUTEI10
		10	BROADA:B01MUTEI20
		11	BROADA:B01MUTEI30
		12	BROADA:B01MUTEI40

LOGIC INPUT

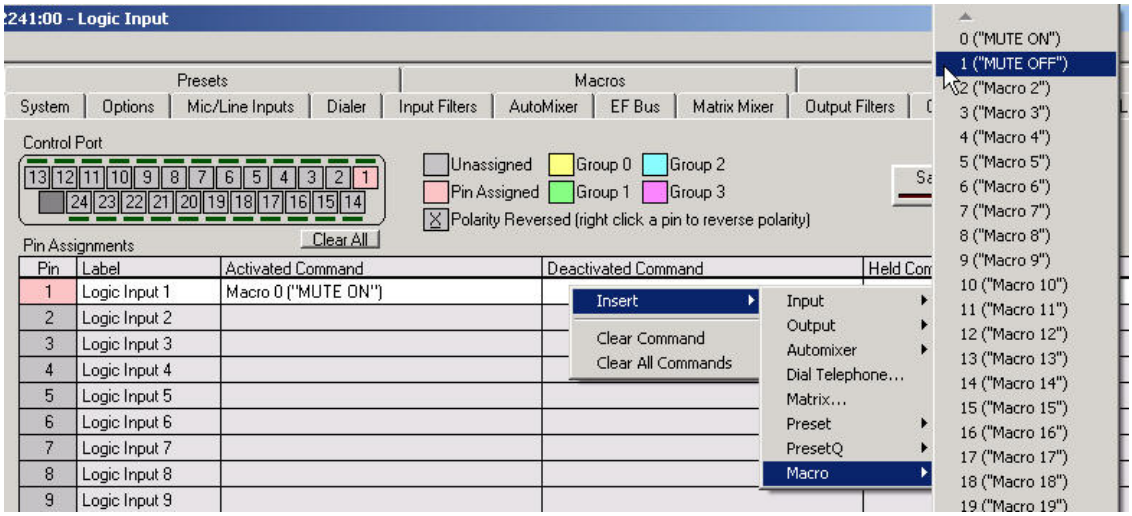
Go to the Logic Input page of Conference Composer. If the SWITCH OUT wire is connected to Logic Input pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic and selecting the pink color (The pink color means that the pin is not grouped to other pins).



Now, place the cursor in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, MACRO, 0 ("MUTE ON"). Now, whenever the switch goes Active Low (0V DC), the Vortex Device will execute Macro 0.



Now, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, MACRO, 1 "(MUTE OFF"). Now, whenever the switch goes Active High (+ 5V DC), the Vortex Device will execute Macro 1.

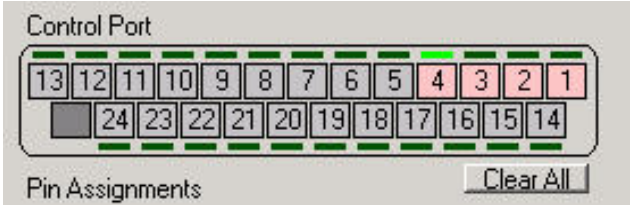


Do not assign any command to the HELD COMMAND column.

Repeat the process for each microphone that is connected to the Logic Input port. If you are successful, you should see this on the screen (the screenshot is from a Vortex EF2241):

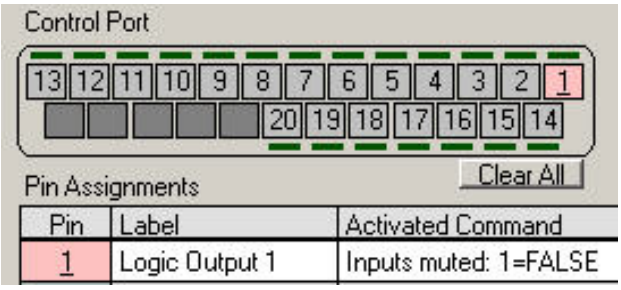
Pin	Label	Activated Command	Deactivated Command	Held Command
1	Logic Input 1	Macro 0 ("MUTE ON")	Macro 1 ("MUTE OFF")	
2	Logic Input 2	Macro 0 ("MUTE ON")	Macro 1 ("MUTE OFF")	
3	Logic Input 3	Macro 0 ("MUTE ON")	Macro 1 ("MUTE OFF")	
4	Logic Input 4	Macro 0 ("MUTE ON")	Macro 1 ("MUTE OFF")	

Make sure that the physical wiring works by pressing the membrane switch. You should see the LED above the pin assignment lit in green:



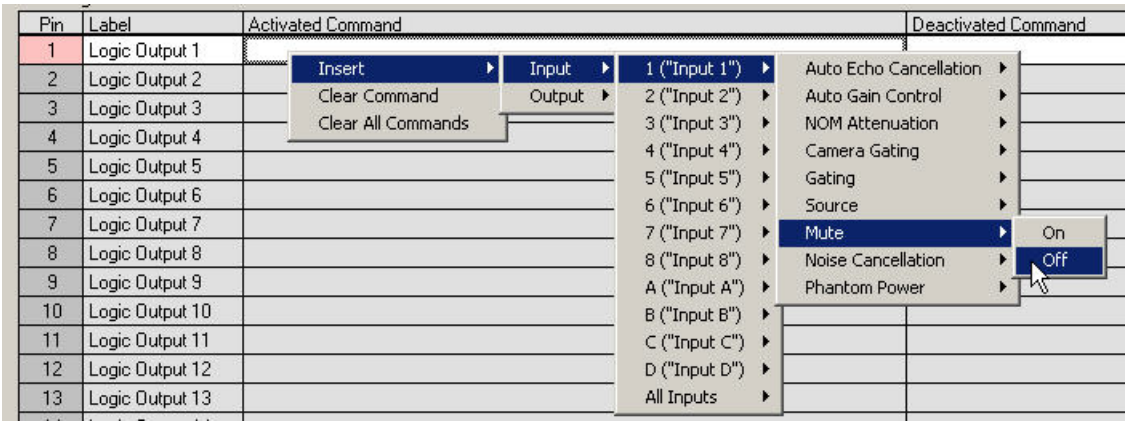
Logic Output

Go to the Logic Output page of Conference Composer. If the LED IN wire is connected to Logic Output pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic. The pin will turn color from gray to pink. Next, right-click on the pin and reverse the polarity. A horizontal bar should appear under the pin number in the DB-25 graphic and under the pin number under the Pin column:

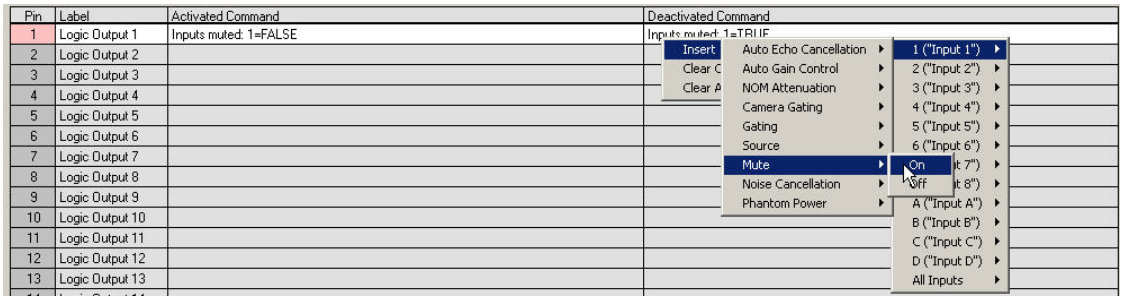


Reversing the polarity is critical to proper operation. When S3 is in the ON position, the MX392 wants to see an Active Low signal (0V DC) from the Vortex Device in order to illuminate the LED. By default, the Vortex Device has been designed to assume that an Active High signal (+5V DC) is required to drive an LED. The MX392 uses the active low signal to use part of the phantom power voltage to illuminate the LED. If you do not reverse the polarity, the LED will light up exactly the opposite way you will have intended.

Next, right click in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the microphone is unmuted (Mute = False), the LED will illuminate on the MX392.



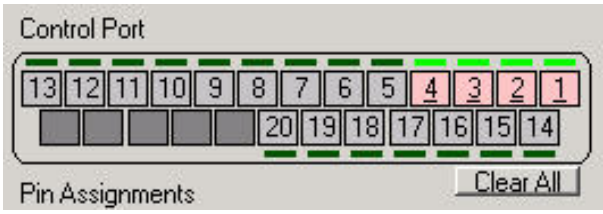
Next, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, ON. Now, whenever the microphone is muted (Mute = True), the LED will not illuminate on the MX392.



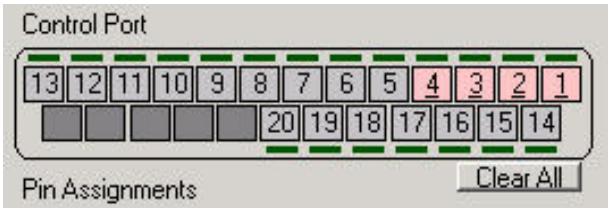
Here is what the screen should look like when you are finished (assuming a Vortex EF2241):

Pin	Label	Activated Command	Deactivated Command
1	Logic Output 1	Inputs muted: 1=FALSE	Inputs muted: 1=TRUE
2	Logic Output 2	Inputs muted: 2=FALSE	Inputs muted: 2=TRUE
3	Logic Output 3	Inputs muted: 3=FALSE	Inputs muted: 3=TRUE
4	Logic Output 4	Inputs muted: 4=FALSE	Inputs muted: 4=TRUE

Make sure the LED works as designed. If you press the membrane switch, you should see the LED above the pins illuminate in Conference Composer as well as on every MX392. Since the switch is a toggle switch, the LED will stay lit until the switch is pushed again:



When the membrane switch is pushed again, the EF Device toggles the state from unmuted to muted. Now, the LED should not be illuminated since the input from the MX392 is now muted. Both LED's (Conference Composer and MX392) should not be illuminated:



MOMENTARY OPERATION (PUSH TO TALK)

Let's say that you want MX392 to be muted by default. If someone pushes the membrane switch, you want the microphone to stay unmuted while the user continues to hold the switch down. You also want the LED to illuminate when the microphone is unmuted.

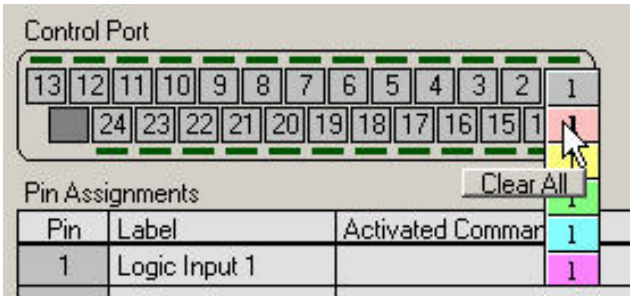
First, set DIP Switch S2, and S3 to ON and set S1 and S4 to OFF. Then, connect SWTICH OUT to one of the Logic Input pins 1-24. Connect LOGIC GND to Logic Output pins 21-25. Connect LED IN to one of the Logic Output pins 1-20.

DEFAULT CONDITIONS

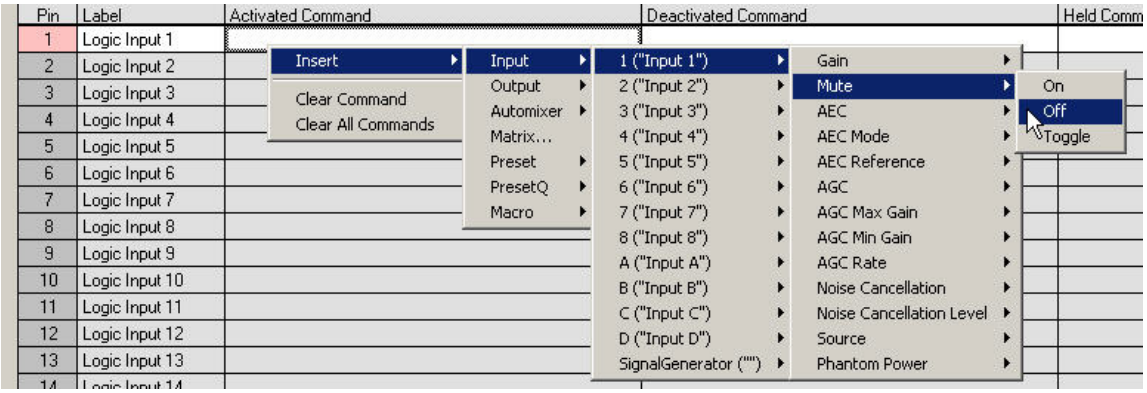
First, you want to make sure that the Vortex Device has all microphones muted as part of the Power on Preset. Next, you need to make sure that if the unit is controlled by a control system that the proper commands are sent to the Vortex Device to mute the microphones when the room is used for conferencing or sound reinforcement purposes. Remember that since the requirement is push to talk, the user of the microphone is the one that must initiate the activity of unmuting the microphone.

LOGIC INPUT

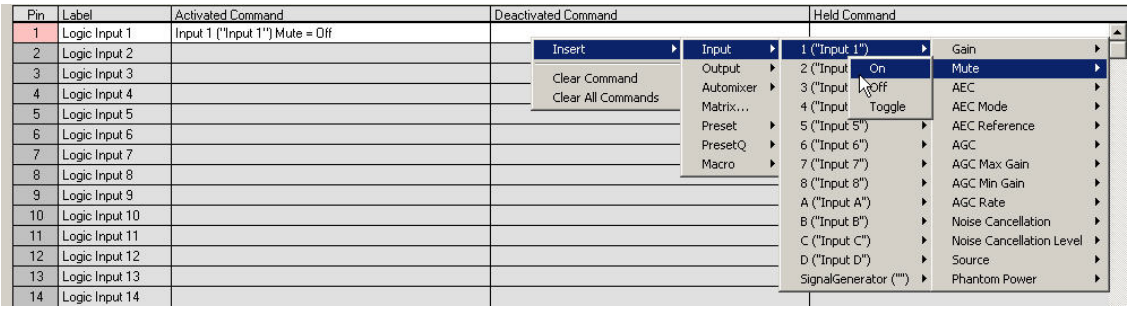
Go to the Logic Input page of Conference Composer. If the SWITCH OUT wire is connected to Logic Input pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic and selecting the pink color (The pink color means that the pin is not grouped to other pins).



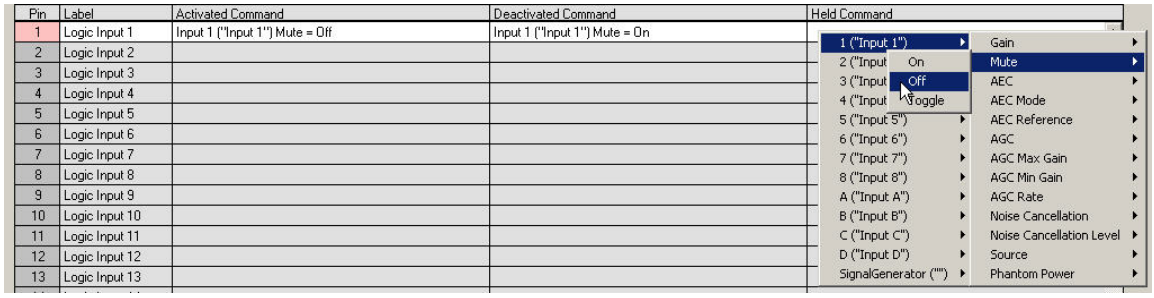
Now, right click in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the switch goes Active Low (0V DC), the Vortex Device will unmute Input 1.



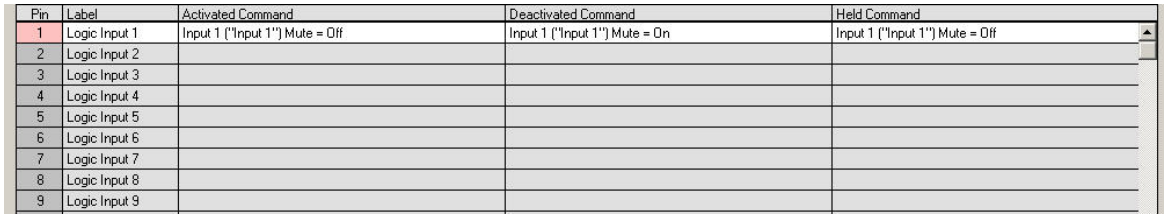
Now, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, ON. Now, whenever the switch goes Active High (+ 5V DC), the Vortex Device will mute Input 1.



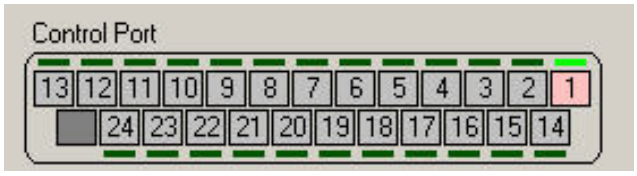
Now, right click in the HELD COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the switch goes Active Low (0V DC), the Vortex Device will unmute Input 1.



If you are successful, you should see this on the screen:



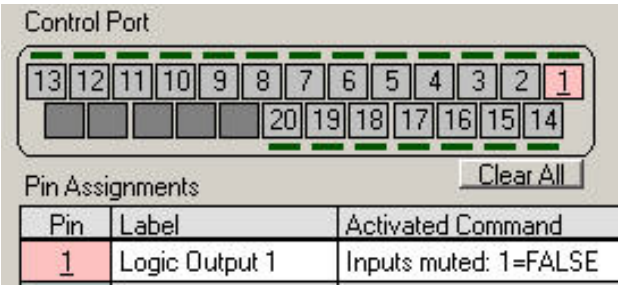
Make sure that the physical wiring works by pressing and holding the membrane switch. You should see the LED above the pin assignment lit in green:



Repeat the above process for each MX392 microphone that you want to connect to the Vortex Device.

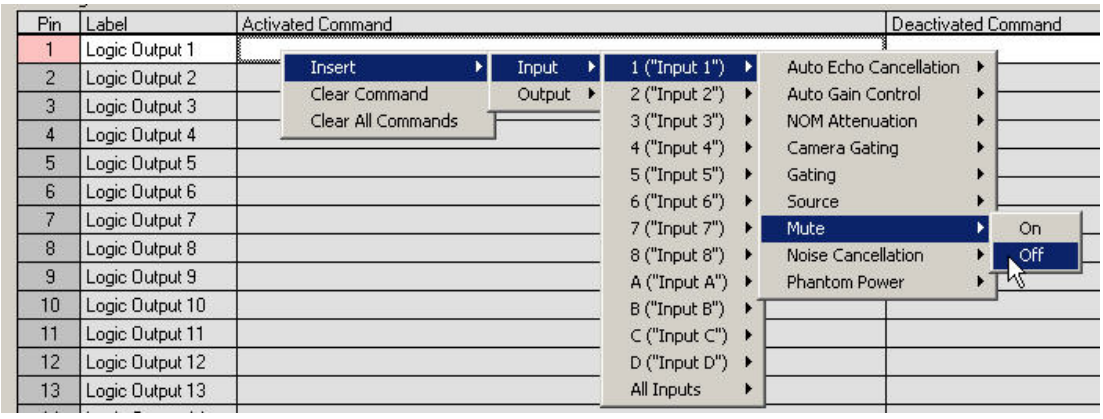
LOGIC OUTPUT

Go to the Logic Output page of Conference Composer. If the LED IN wire is connected to Logic Output pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic. The pin will turn color from gray to pink. Next, right-click on the pin and reverse the polarity. A horizontal bar should appear under the pin number in the DB-25 graphic and under the pin number under the Pin column:

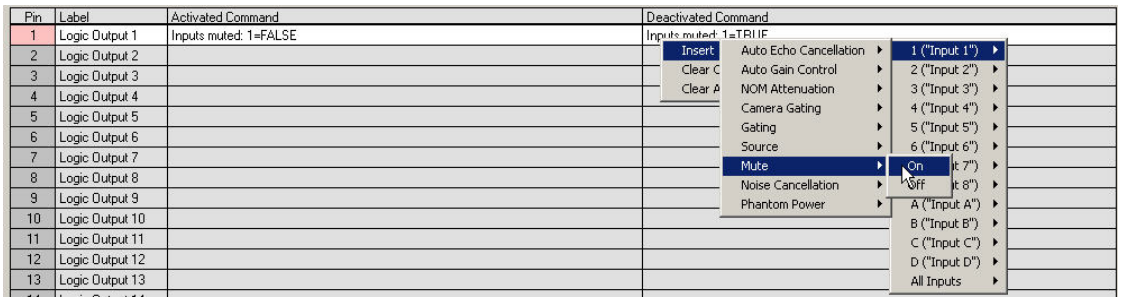


Reversing the polarity is critical to proper operation. When S3 is in the ON position, the MX392 wants to see an Active Low signal (0V DC) from the Vortex Device in order to illuminate the LED. By default, the EF Device has been designed to assume that an Active High signal (+5V DC) is required to drive an LED. The MX392 uses the active low signal to use part of the phantom power voltage to illuminate the LED. If you do not reverse the polarity, the LED will light up exactly the opposite way you will have intended.

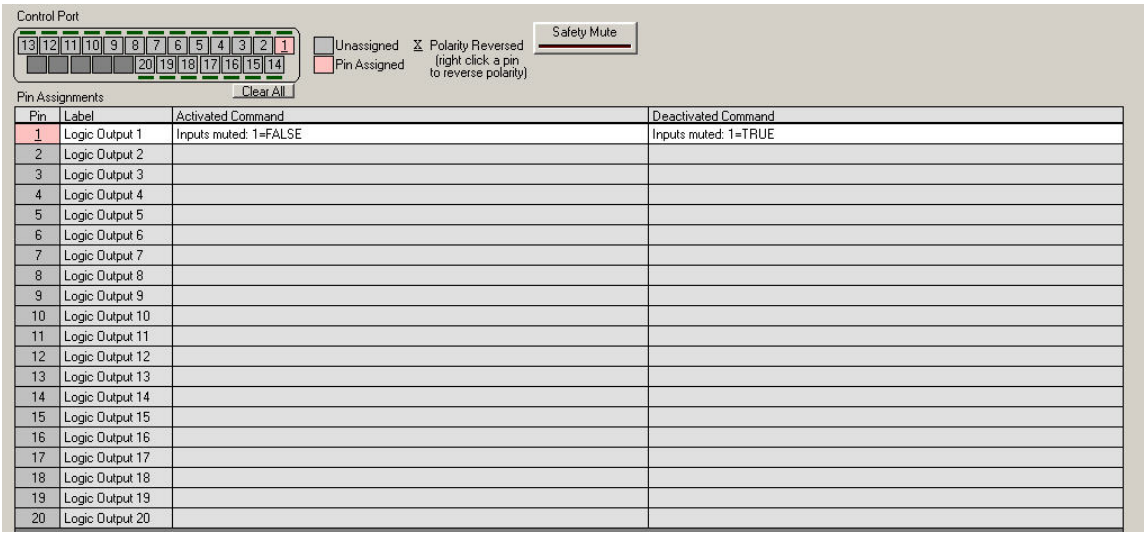
Next, right click in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the microphone is unmuted (Mute = False), the LED will illuminate on the MX392.



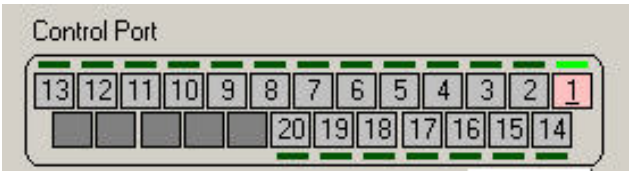
Next, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, ON. Now, whenever the microphone is muted (Mute = True), the LED will not illuminate on the MX392.



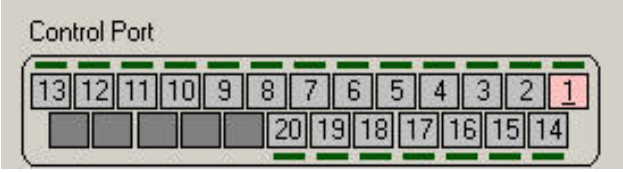
Here is what the screen should look like when you are finished:



Make sure the LED works as designed. If you press the membrane switch, you should see the LED above the pin illuminate in Conference Composer as well as on the MX392. Since the switch is a toggle switch, the LED will stay lit until the switch is pushed again:



When the membrane switch is pushed again, the EF Device toggles the state from unmuted to muted. Now, the LED should not be illuminated since the input from the MX392 is now muted. Both LED's (Conference Composer and MX392) should not be illuminated:



MOMENTARY OPERATION (PUSH TO MUTE)

Let's say that you want MX392 to be unmuted by default. If someone pushes the membrane switch, you want the microphone to stay muted while the user continues to hold the switch down. You also want the LED to illuminate when the microphone is unmuted and not illuminate when the microphone is muted.

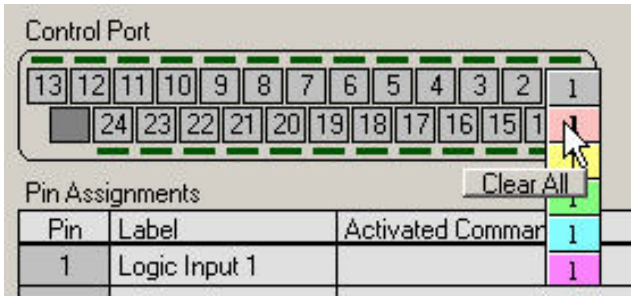
First, set DIP Switch S2, and S3 to ON and set S1 and S4 to OFF. Then, connect SWTICH OUT to one of the Logic Input pins 1-24. Connect LOGIC GND to Logic Output pins 21-25. Connect LED IN to one of the Logic Output pins 1-20.

DEFAULT CONDITIONS

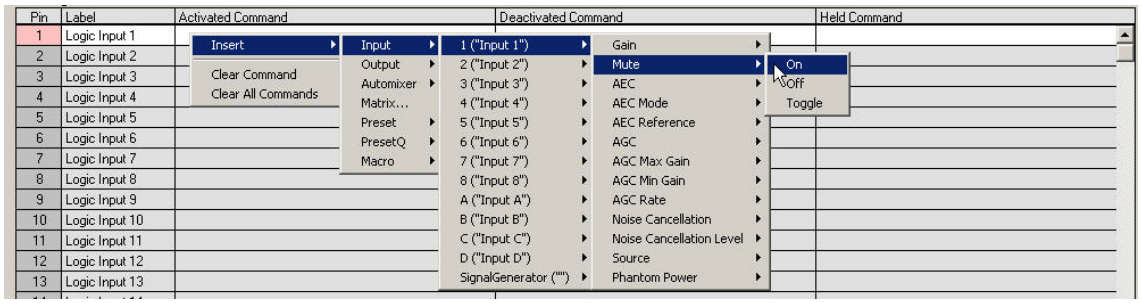
First, you want to make sure that the Vortex Device has all microphones unmuted as part of the Power on Preset. Next, you need to make sure that if the unit is controlled by a control system that the proper commands are sent to the Vortex Device to unmute the microphones when the room is used for conferencing or sound reinforcement purposes. Remember that since the requirement is push to mute, the user of the microphone is the one that must initiate the activity of muting the microphone.

LOGIC INPUT

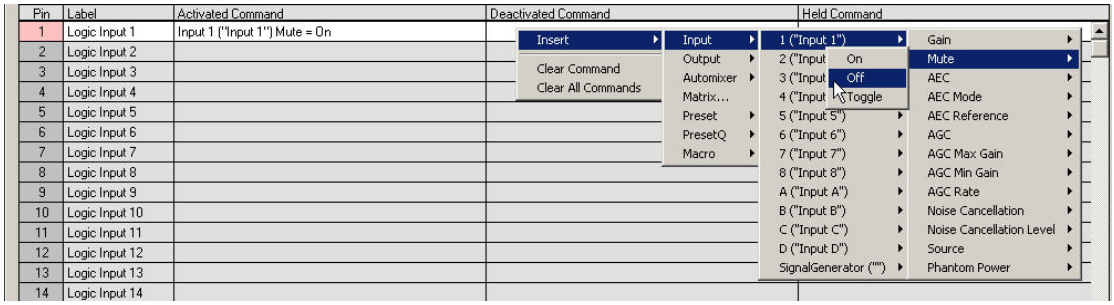
Go to the Logic Input page of Conference Composer. If the SWITCH OUT wire is connected to Logic Input pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic and selecting the pink color (The pink color means that the pin is not grouped to other pins).



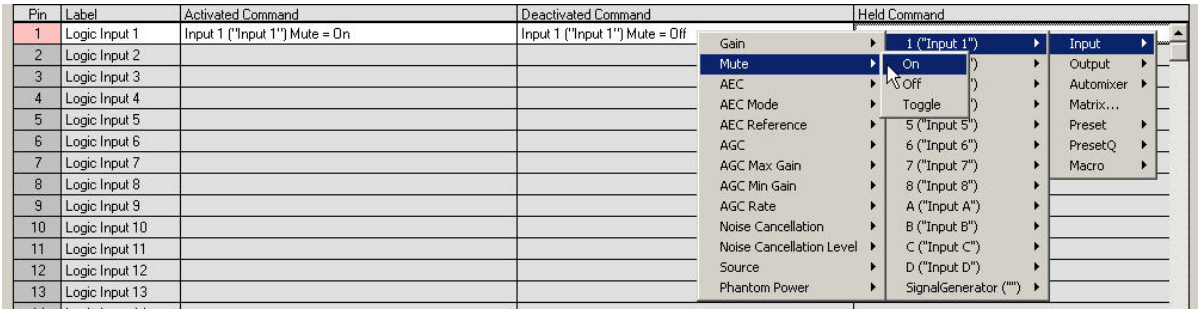
Now, right click in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, ON. Now, whenever the switch goes Active Low (0V DC), the Vortex Device will mute Input 1.



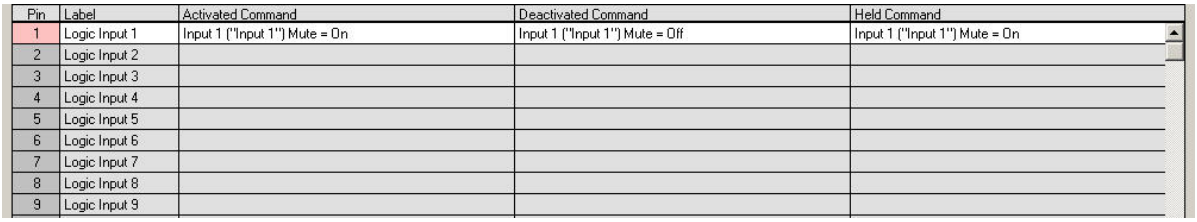
Now, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the switch goes Active High (+ 5V DC), the Vortex Device will unmute Input 1.



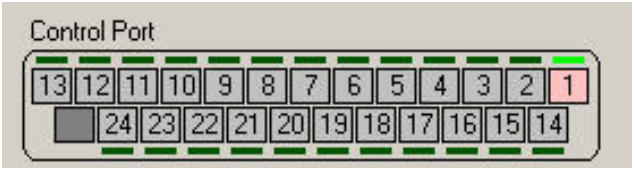
Now, right click in the HELD COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, ON. Now, as long as the switch is Active Low (0V DC), the Vortex Device will mute Input 1.



If you are successful, you should see this on the screen:



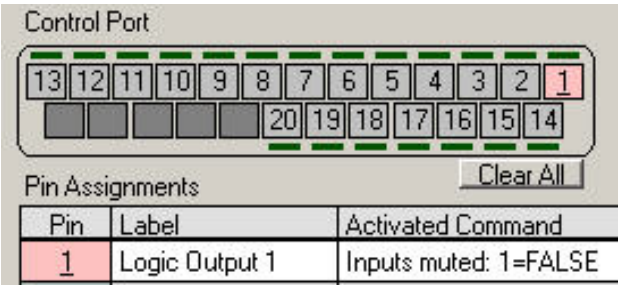
Make sure that the physical wiring works by pressing and holding the membrane switch. You should see the LED above the pin assignment lit in green:



Repeat the above process for each MX392 microphone that you want to connect to the Vortex Device.

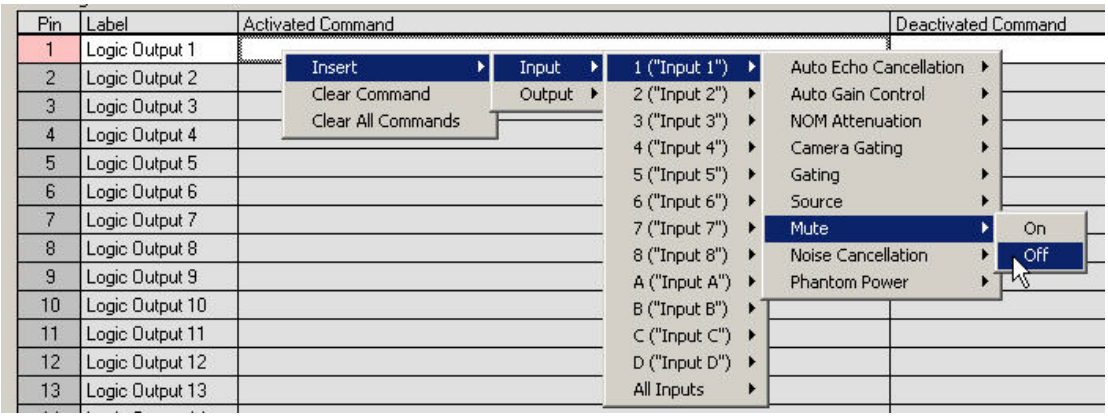
LOGIC OUTPUT

Go to the Logic Output page of Conference Composer. If the LED IN wire is connected to Logic Output pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic. The pin will turn color from gray to pink. Next, right-click on the pin and reverse the polarity. A horizontal bar should appear under the pin number in the DB-25 graphic and under the pin number under the Pin column:

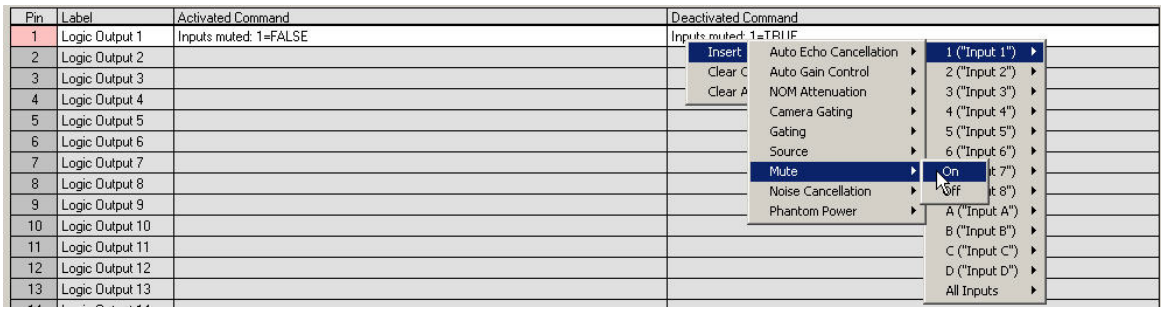


Reversing the polarity is critical to proper operation. When S3 is in the ON position, the MX392 wants to see an Active Low signal (0V DC) from the Vortex Device in order to illuminate the LED. By default, the EF Device has been designed to assume that an Active High signal (+5V DC) is required to drive an LED. The MX392 uses the active low signal to use part of the phantom power voltage to illuminate the LED. If you do not reverse the polarity, the LED will light up exactly the opposite way you will have intended.

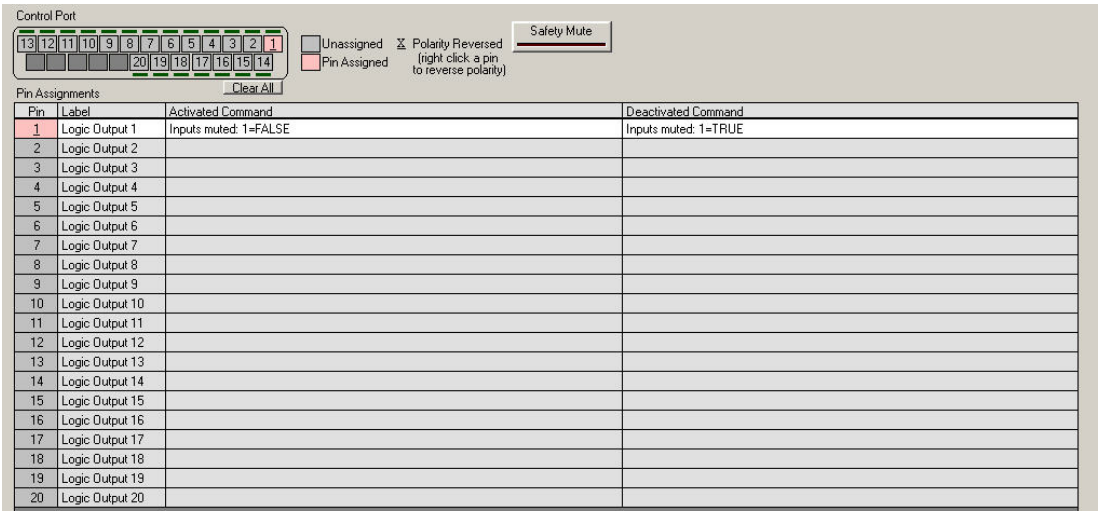
Next, right click in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the microphone is unmuted (Mute = False), the LED will illuminate on the MX392.



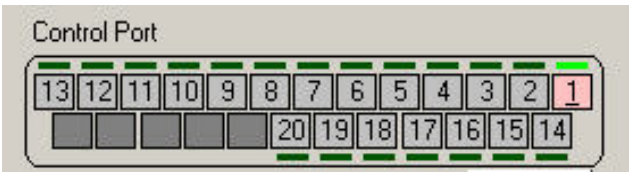
Next, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, ON. Now, whenever the microphone is muted (Mute = True), the LED will not illuminate on the MX392.



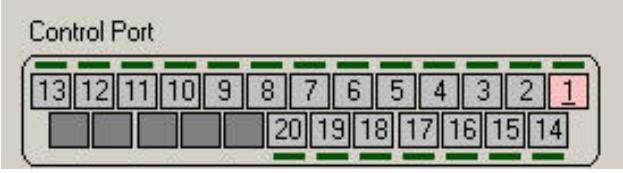
Here is what the screen should look like when you are finished:



Make sure the LED works as designed. If you press the membrane switch, you should see the LED above the pin illuminate in Conference Composer as well as on the MX392. Since the switch is a toggle switch, the LED will stay lit until the switch is pushed again:



When the membrane switch is pushed again, the Vortex Device toggles the state from unmuted to muted. Now, the LED should not be illuminated since the input from the MX392 is now muted. Both LED's (Conference Composer and MX392) should not be illuminated:



MOMENTARY OPERATION MUTE ALL EXAMPLE

Let's say that you have 2 Vortex units linked together via EFBus--1 Vortex EF2280 at Device ID 00 and 1 Vortex EF2241 at Device ID 01. When someone pushes and holds the membrane switch on one microphone, you want that action to mute all microphones as well as turn off the LED as long as the switch is held by the user. When the switch is released, all microphones are unmuted. This example explores the process in achieving that goal.

First, set DIP Switch S2, and S3 to ON and set S1 and S4 to OFF. Then, connect SWTICH OUT to one of the Logic Input pins 1-24. Connect LOGIC GND to Logic Output pins 21-25. Connect LED IN to one of the Logic Output pins 1-20.

DEFAULT CONDITIONS

First, you want to make sure that the Vortex Device has all microphones unmuted as part of the Power on Preset. Next, you need to make sure that if the unit is controlled by a control system that the proper commands are sent to the Vortex Device to unmute the microphones when the room is used for conferencing or sound reinforcement purposes. Remember that since the requirement is push to mute, the user of the microphone is the one that must initiate the activity of muting the microphone.

MACROS

Go to the MACROS page of Conference Composer. To make things easy, label Macro 0 as MUTE ON and label Macro 1 as MUTE OFF. Then, for each microphone that is physically connected to the Vortex, add commands to Macro 0 that mute the microphones and add commands to Macro 1 that unmute the microphones. When you're done, this is what the Macros page should look like:

Macro	Name	Item	Command
0	MUTE ON	1	Input 1 ("Mic 1") Mute = On
		2	Input 2 ("Mic 2") Mute = On
		3	Input 3 ("Mic 3") Mute = On
		4	Input 4 ("Mic 4") Mute = On
		5	Input 5 ("Mic 5") Mute = On
		6	Input 6 ("Mic 6") Mute = On
		7	Input 7 ("Mic 7") Mute = On
		8	Input 8 ("Mic 8") Mute = On
1	MUTE OFF	1	Input 1 ("Mic 1") Mute = Off
		2	Input 2 ("Mic 2") Mute = Off
		3	Input 3 ("Mic 3") Mute = Off
		4	Input 4 ("Mic 4") Mute = Off
		5	Input 5 ("Mic 5") Mute = Off
		6	Input 6 ("Mic 6") Mute = Off
		7	Input 7 ("Mic 7") Mute = Off
		8	Input 8 ("Mic 8") Mute = Off
2	Macro 2		

Likewise, here is the Macros page for the Vortex EF2241:

Macro	Name	Item	Command
0	MUTE ON	1	Input 1 ("Mic 9") Mute = On
		2	Input 2 ("Mic 10") Mute = On
		3	Input 3 ("Mic 11") Mute = On
		4	Input 4 ("Mic 12") Mute = On
1	MUTE OFF	1	Input 1 ("Mic 9") Mute = Off
		2	Input 2 ("Mic 10") Mute = Off
		3	Input 3 ("Mic 11") Mute = Off
		4	Input 4 ("Mic 12") Mute = Off

In order for one microphone to mute all microphones, we need to be able to mute and unmute the

microphones on all units regardless of whether a microphone is muted from the Vortex EF2280 or the Vortex EF2241. To accomplish this, we will use the **BROADA** command to send MUTEI commands from one unit to the other unit. The **BROADA** command broadcasts any command that is after the colon. For example, if a Macro in the Vortex EF2241 has this command:

BROADA:F00MUTEI11

then when this Macro is executed, the microphone that is connected to EF2280 ID 00 will be muted.

In order to do this, let's look at the Macros page of the Vortex EF2280. Left-click on Item 8 in Macro 0. Then click the INSERT button to add a ninth command to Macro 0. At this point, place the cursor in the COMMAND column and type:

BROADA:B01MUTEI11

Repeat that same process for Inputs 2-4 of the EF2241. The, perform the same procedure to unmute Inputs 1-4 on the EF2241. Remember that there is a colon after the **BROADA** command. When you are finished, here is what the Macros page should look like:

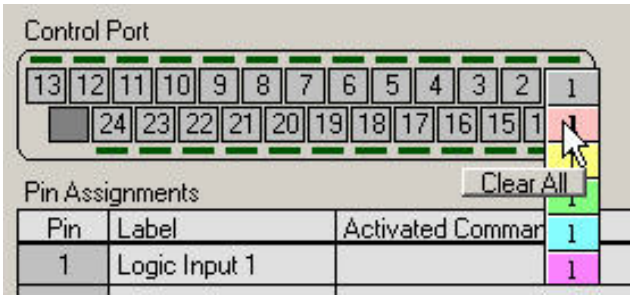
Macro	Name	Item	Command
0	MUTE ON	1	Input 1 ("Mic 9") Mute = On
		2	Input 2 ("Mic 10") Mute = On
		3	Input 3 ("Mic 11") Mute = On
		4	Input 4 ("Mic 12") Mute = On
		5	BROADA:F00MUTE11
		6	BROADA:F00MUTEI21
		7	BROADA:F00MUTEI31
		8	BROADA:F00MUTEI41
		9	BROADA:F00MUTEI51
		10	BROADA:F00MUTEI61
		11	BROADA:F00MUTEI71
		12	BROADA:F00MUTEI81
1	MUTE OFF	1	Input 1 ("Mic 9") Mute = Off
		2	Input 2 ("Mic 10") Mute = Off
		3	Input 3 ("Mic 11") Mute = Off
		4	Input 4 ("Mic 12") Mute = Off
		5	BROADA:F00MUTEI10
		6	BROADA:F00MUTEI20
		7	BROADA:F00MUTEI30
		8	BROADA:F00MUTEI40
		9	BROADA:F00MUTEI50
		10	BROADA:F00MUTEI60
		11	BROADA:F00MUTEI70
		12	BROADA:F00MUTEI80

Follow the same procedure for muting the Inputs 1-8 on the Vortex EF2280 from the EF2241. Here is what the Macros page for the Vortex EF2241 should look like when you are finished:

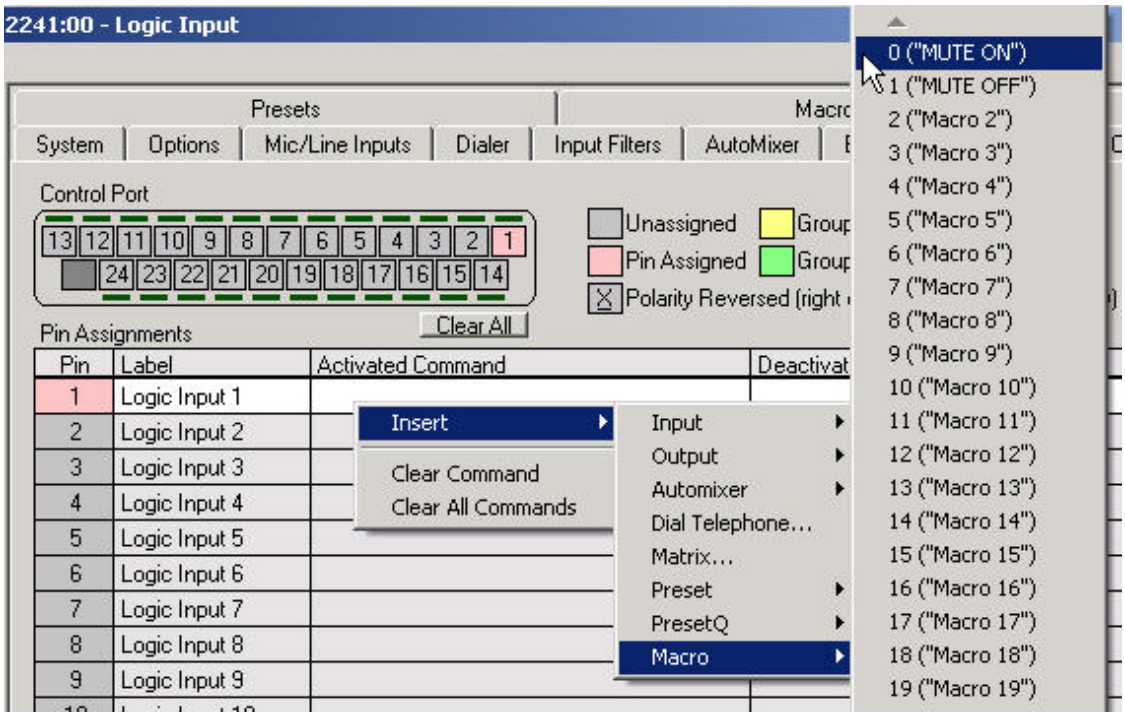
Macro	Name	Item	Command
0	MUTE ON	1	Input 1 ("Mic 1") Mute = On
		2	Input 2 ("Mic 2") Mute = On
		3	Input 3 ("Mic 3") Mute = On
		4	Input 4 ("Mic 4") Mute = On
		5	Input 5 ("Mic 5") Mute = On
		6	Input 6 ("Mic 6") Mute = On
		7	Input 7 ("Mic 7") Mute = On
		8	Input 8 ("Mic 8") Mute = On
		9	BROADA:B01MUTEI11
		10	BROADA:B01MUTEI21
		11	BROADA:B01MUTEI31
		12	BROADA:B01MUTEI41
1	MUTE OFF	1	Input 1 ("Mic 1") Mute = Off
		2	Input 2 ("Mic 2") Mute = Off
		3	Input 3 ("Mic 3") Mute = Off
		4	Input 4 ("Mic 4") Mute = Off
		5	Input 5 ("Mic 5") Mute = Off
		6	Input 6 ("Mic 6") Mute = Off
		7	Input 7 ("Mic 7") Mute = Off
		8	Input 8 ("Mic 8") Mute = Off
		9	BROADA:B01MUTEI10
		10	BROADA:B01MUTEI20
		11	BROADA:B01MUTEI30
		12	BROADA:B01MUTEI40

LOGIC INPUT

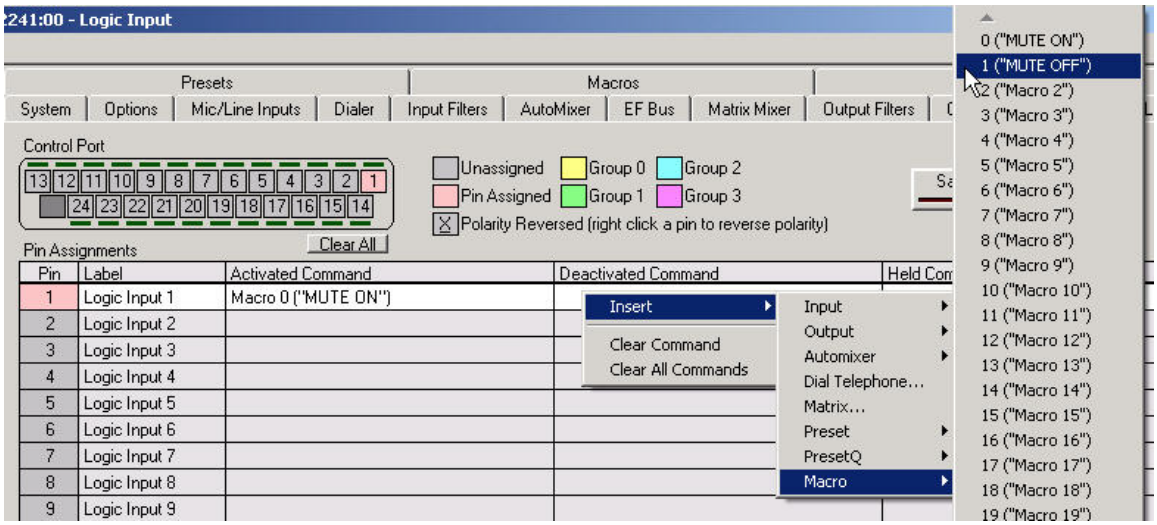
Go to the Logic Input page of Conference Composer. If the SWITCH OUT wire is connected to Logic Input pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic and selecting the pink color (The pink color means that the pin is not grouped to other pins).



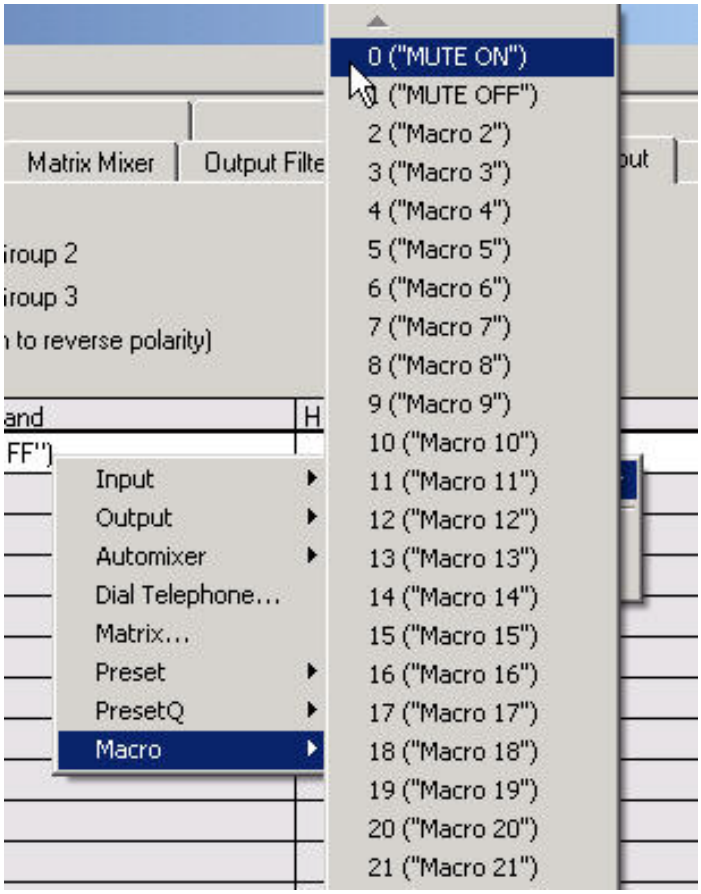
Now, place the cursor in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, MACRO, 0 ("MUTE ON"). Now, whenever the switch goes Active Low (0V DC), the Vortex Device will execute Macro 0.



Now, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, MACRO, 1 "(MUTE OFF"). Now, whenever the switch goes Active High (+ 5V DC), the Vortex Device will execute Macro 1.



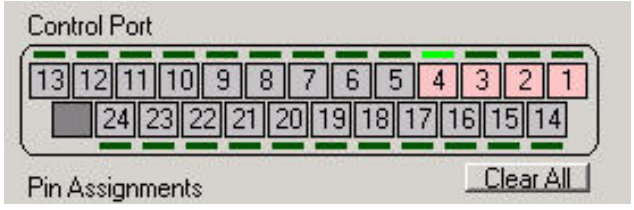
Now, right click in the HELD COMMAND column for Logic Input 1 and select INSERT, MACRO, 0 "(MUTE ON"). Now, as long as the switch is held down, the Vortex Device will execute Macro 0.



Repeat the process for each microphone that is connected to the Logic Input port. If you are successful, you should see this on the screen (the screenshot is from a Vortex EF2241):

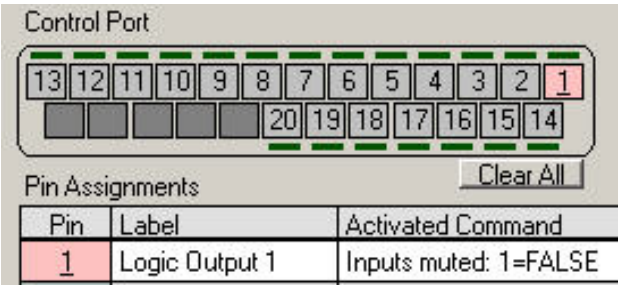
Pin	Label	Activated Command	Deactivated Command	Held Command
1	Logic Input 1	Macro 0 ("MUTE ON")	Macro 1 ("MUTE OFF")	Macro 0 ("MUTE ON")
2	Logic Input 2	Macro 0 ("MUTE ON")	Macro 1 ("MUTE OFF")	Macro 0 ("MUTE ON")
3	Logic Input 3	Macro 0 ("MUTE ON")	Macro 1 ("MUTE OFF")	Macro 0 ("MUTE ON")
4	Logic Input 4	Macro 0 ("MUTE ON")	Macro 1 ("MUTE OFF")	Macro 0 ("MUTE ON")

Make sure that the physical wiring works by pressing the membrane switch. You should see the LED above the pin assignment lit in green as long as the switch is held down:



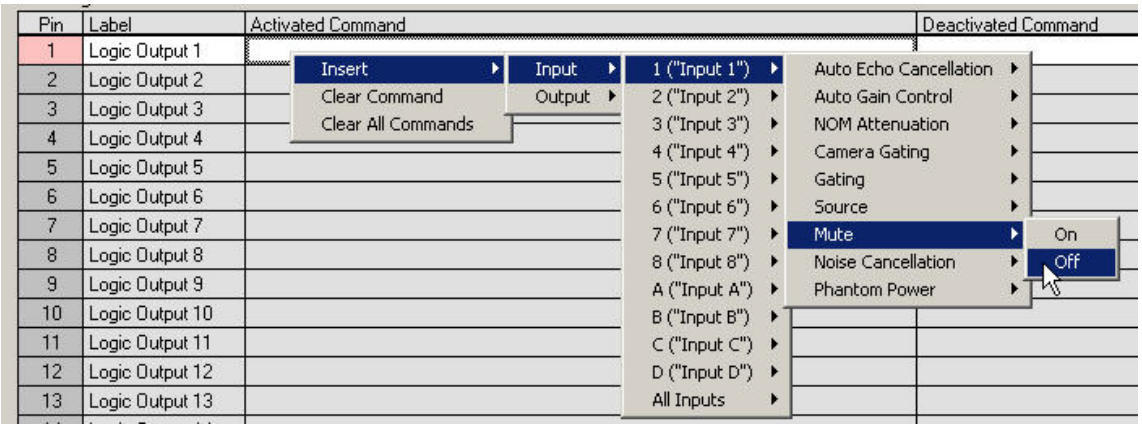
LOGIC OUTPUT

Go to the Logic Output page of Conference Composer. If the LED IN wire is connected to Logic Output pin 1, then you need to assign Pin 1 by left-clicking the desired pin in the DB-25 graphic. The pin will turn color from gray to pink. Next, right-click on the pin and reverse the polarity. A horizontal bar should appear under the pin number in the DB-25 graphic and under the pin number under the Pin column:

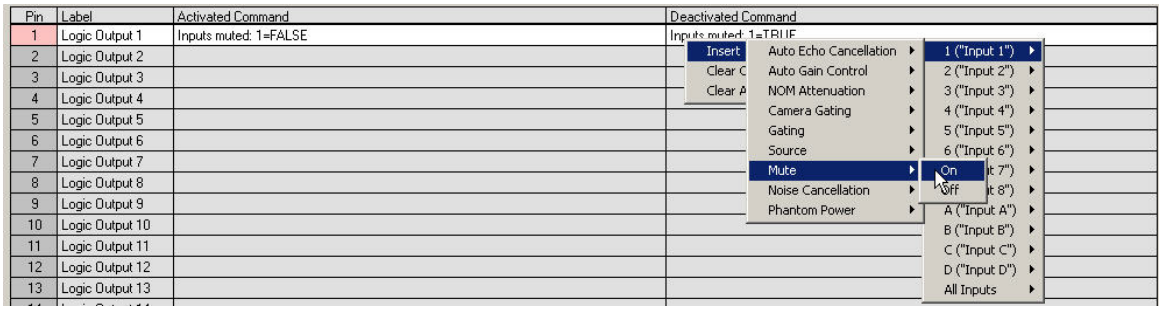


Reversing the polarity is critical to proper operation. When S3 is in the ON position, the MX392 wants to see an Active Low signal (0V DC) from the Vortex Device in order to illuminate the LED. By default, the Vortex Device has been designed to assume that an Active High signal (+5V DC) is required to drive an LED. The MX392 uses the active low signal to use part of the phantom power voltage to illuminate the LED. If you do not reverse the polarity, the LED will light up exactly the opposite way you will have intended.

Next, right click in the ACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, OFF. Now, whenever the microphone is unmuted (Mute = False), the LED will illuminate on the MX392.



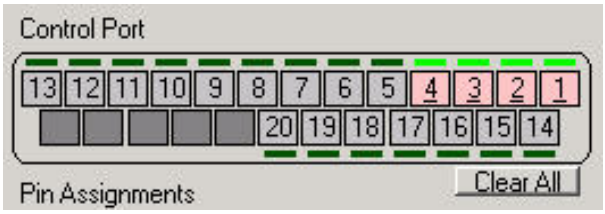
Next, right click in the DEACTIVATED COMMAND column for Logic Input 1 and select INSERT, INPUT, 1, MUTE, ON. Now, whenever the microphone is muted (Mute = True), the LED will not illuminate on the MX392.



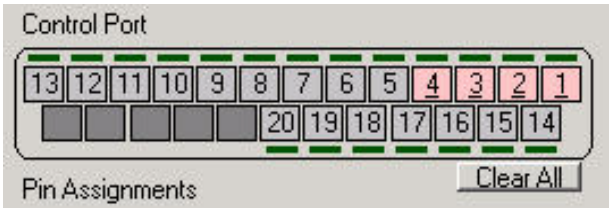
Here is what the screen should look like when you are finished (assuming a Vortex EF2241):

Pin	Label	Activated Command	Deactivated Command
1	Logic Output 1	Inputs muted: 1=FALSE	Inputs muted: 1=TRUE
2	Logic Output 2	Inputs muted: 2=FALSE	Inputs muted: 2=TRUE
3	Logic Output 3	Inputs muted: 3=FALSE	Inputs muted: 3=TRUE
4	Logic Output 4	Inputs muted: 4=FALSE	Inputs muted: 4=TRUE

Make sure the LED works as designed. If you press the membrane switch, you should see the LED above the pins illuminate in Conference Composer as well as on every MX392. Since the switch is a membrane switch, the LED will stay lit until the switch is pushed and held down:



When the membrane switch is pushed and held down, the EF Device toggles the state from unmuted to muted. Now, the LED should not be illuminated since the input from the MX392 is now muted. Both LED's (Conference Composer and MX392) should not be illuminated and should remain unilluminated as long as the switch is held down on one of the microphones:



TECHNICAL SUPPORT

For support on the Vortex product line, call toll-free (USA/Canada) 888-248-4143, then select option 1, then option 3.

For exclusive Integrator and Consultant focused support (through our PASS program), dial 1.408.474.2048; this number will get you help on video and Vortex products.

For general technical support, dial 1.800.POLYCOM

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